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ABSTRACT

Job Insecurity, Debt Burdens and Individual Health*

Job insecurity exerts negative effects on self-reported health. Using the Spanish Survey of Household Finances for 2011-2014, this paper asks whether and to what extent debt burdens enhance these detrimental health effects. To address potential endogeneity problems surrounding this question, the paper adopts Deb and Trivedi's (2006) econometric approach. The results show that the negative effect of job insecurity on self-assessed health is exacerbated if the individual is over-indebted. Moreover, the role of over-indebtedness differs between types of debt, with nonmortgage debts causing larger health losses than mortgage debts. Specifically, the results suggest that being over-indebted with non-mortgage debts boosts the negative impact of job insecurity by a factor of three. Thus, concerns about job insecurity should not be decoupled from concerns about increasing household indebtedness, and policy measures intended to improve individual welfare should consider both phenomena together.

JEL Classification:	G01, I14, I22
Keywords:	self-assessed health, job insecurity, debt burdens

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1. Introduction

The harmful effects of job insecurity, an important domain of economic insecurity, into individual well-being have gained attention among politicians and practitioners in the EU area, especially after the great recession of 2008. In this respect, the Commission on the Measurement of Economic Performance and Social Progress has recognized economic insecurity as fundamental to understand people's economic well-being and to give economic policy a wider perspective (see Stiglitz et al., 2009, p.198).

Job insecurity is a subjective experience, resulting from a person's perception and interpretation of the actual work environment. It might exert adverse effects on individual's well-being that may be as detrimental, if not more, than the actual occurrence of job loss (Burgard et al., 2009). The feelings of uncertainty and ambiguity that result from lack of control over the stressful events of potential job loss, may be among the main factors driven these deleterious effects on well-being (Lazarus and Folkman, 1984). Moreover, the prospects of losing one's job also means the frustration of some fundamental human needs such as e.g., the need for survival, relatedness, and self-determination (Van den Broeck et al., 2008), that would inevitably lead to the impairment of health and well-being.

From the great recession of 2008, the dramatic rise in the unemployment rates and the economic turbulence might very well have induced workers at all levels of the occupational hierarchy to see their future threatened. In parallel, in the same period, the number of households that face severe debt-related financial difficulties has sharply risen, making over-indebtedness of individuals and families a widespread phenomenon in the EU area. This increased household's financial fragility might have boosted the negative consequences of job insecurity on individual well-being, which would suggest the necessity for specific policy interventions aimed at the most fragile segments of the population.

This paper examines to what extent the effects of job insecurity on individual well-being, measured in terms of self-assessed health (SAH), are heterogeneous across individuals' financial situations. We are not the first attempt to account for such heterogeneity. However earlier literature has mainly focused on income. The novelty of our work relies on the fact that we use debt burdens to better proxy the financial situation of the individual. The advantages of this choice are threefold. First, while income is a flow and, as such, it is unable to capture long-term financial conditions and fears, debt burdens significantly condition future financial constraints and seriously limit the individual's ability to buffer negative economic shocks. Second, the negative health effects of job insecurity have been found to be homogeneous across the entire income distribution. Specifically, the relatively well-off (those located in the top income quartiles) suffer from job insecurity at a magnitude comparable to those in the lowest quartiles (Lam et al., 2014; Kopasker et al., 2018). Thus, there is no empirical evidence of income being a relevant mediating

factor between job insecurity on self-assessed health. Third, after the great recession of 2008 there was a huge increase on the number of households in the EU area that face severe debt-related financial difficulties. Apart from political concerns on households' ability to sustain debt burdens, rising pending debts and its heterogeneous incidence across the population may have intensified and introduced a substantial amount of heterogeneity in the job insecurity-health relationship. Our main contribution is the finding that over-indebtedness – especially related to non-mortgage debts – boosts the negative impact of job insecurity on health. This result thus would provide evidence that individual's financial situation, in terms of debt burdens, partially shapes the heterogeneous effects of job insecurity onto self-assessed health.

Another important feature of the paper is that it takes advantage of Deb and Trivedi's (2006) method to account for sources of endogeneity that surround the association between job insecurity, debt burdens and health. On the one hand, as pointed out by Osberg (2018), issues of endogeneity play a crucial role in assessing the casual impact of economic insecurity on individual outcomes like self-reported health. Since individual measures of economic insecurity are often correlated with other personal characteristics, assessments of causality are often problematic. On the other hand, although most of studies suggest that the direction of causality runs from indebtedness to self-reported health, the causal impact of debt on self-reported health is still a contested matter. Few attempts in the literature have traced the links in the chain of causation from debt to health and from health back to debt (see Gathergood, 2012; Keese and Schmitz, 2014; and Lau and Leung, 2017; among many others). Deb and Trivedi's method allows us to address these problems by recognizing that unobserved characteristics may influence self-reported health, debt burdens and job insecurity simultaneously.

For the purposes of the paper, we use Spanish data from the Survey of Household Finances (EFF) for the 2011-2014 period. Although this survey starts in 2002, we limit our analysis to the 2011-2014 waves because of the unavailability of job insecurity data in previous years. Spain is an interesting country for the question under study. Firstly, unemployment and job insecurity has been a chronical problem in Spain for decades. This situation worsened during the last global economic crisis, a period with dramatic rates of job destruction. Spain's unemployment rate hit 17.2% in 2009, reached 24.2% by the first quarter of 2012, twice the eurozone average, and went over 50% among young and low-skilled individuals. Secondly, the increased home ownership in the boom years left Spain with relatively high household debt before the onset of the global economic crisis. Private debt in relation to the available income grew steadily until 2014. For instance, total household debts over total assets went from 8.6% in 2002 to 11.7% in 2011, and increased further onwards, up to 12.5% in 2014 (Boletín Económico, 2007, 2017). In 2002 about 7% of households with outstanding debts spent more than 40% of their income on debt servicing. This figure doubled by 2011 and was substantially higher among the income-poor.

In June 2013, the volume of outstanding loans of private households amounted to 618,000 million euros (582,887 million euros were mortgages).

The paper is organized as follows. The next section provides an overview on the relationship between health, job insecurity and debt. Section 3 presents the method of analysis and the research hypotheses. Section 4 describes the data set and the measures of job insecurity, over-indebtedness – as a specific measure of debt burdens – and self-reported health used in the paper. Section 5 includes a detailed description of the regression results. Section 6 presents the concluding remarks and further discussion. The paper contains an Appendix with additional estimation results.

2. Review of the literature

It has been firmly confirmed, in an endless number of empirical studies at individual and country levels, that unemployment is detrimental for health and well-being, (Warr, 1987; Clark and Oswald, 1994; Korpi, 1997; Kassenboehmer and Haisken-DeNew, 2009; Salm, 2009; Backhans and Hemmingsson, 2011; among many others).

Apart from unemployment, perceptions of job insecurity are also an important source of lower health and well-being (see De Witte et al., 2015, 2016 for a recent review). Although the scientific interest in the phenomenon of job insecurity was triggered about 30 years ago, with the work of Greenhalgh and Rosenblatt (1984), it has flourished particularly after 2000. As a result of globalization and increasing competition, European labour markets have experienced an increased flexibility, which has led to a non-negligible proportion of workers in Europe to be affected by job insecurity (see László et al., 2010). Thus, the concerns about job insecurity and its impact on individual's health and well-being have gained momentum in the contemporary political discourse, especially after the financial crisis of 2008.

An important challenge for conducting research on job insecurity and its effects is the difficulty of determining how best to measure it. Job insecurity refers to the perception that one's job is unstable or that one is at risk of job loss (Probst et al., 2014). Some studies have classified people as experiencing job insecurity if they work at a factory or organization that has announced layoffs or closure (Ferrie, et al., 1995). Other studies have used indicators of establishment- and industry-level labor market turnover to measure job insecurity (Böckerman et al., 2011). Finally, other works have relied on general economy-wide aggregate measures of insecurity such as the unemployment rate or the extent of earnings volatility (Osberg and Sharpe, 2014). However, aggregate measures do not pick up mean-preserving changes in insecurity across the population. For example, even when the unemployment rate is constant, the risk of job loss may be spread unevenly such that some individuals are exposed to considerably greater risk than others are.

To overcome this shortcoming, researchers have started to use individual-level data on subjective perceptions of economic risk. Subjective data target perceived job insecurity and

typically revolve around a self-assessed question on how likely a person thinks she will lose her job (Cheng and Chang 2008; Origo and Pagani, 2009; Green, 2011). These measures have been validated in the literature by showing that the distribution of responses, though overly pessimistic and spiked in places, are significant correlated with subsequent job loss (see Dickerson and Green, 2009). Questions eliciting subjective experiences are advantaged over other measures, such as statistical indicators of objective hazards, as they account for some individual heterogeneity in perceptions of and tolerance for various economic risks; factors that undoubtedly influence psychological stress (Ferrie et al., 2005). A second source of information to appraise the extent of job insecurity is objective hazards on employment status. Based on the individual's employment historical record, these measures are based on predictions on forward-looking employment outcomes (Rohde et al., 2017). Precisely, these authors show that the negative effects of insecurity on health are robust to the alternative use of subjective and objective indices.

A burgeoning number of empirical papers have provided evidence on the deleterious well-being effects of job insecurity. On the one hand, job insecurity is associated with lower well-being at work-related level, and job satisfaction (Sverke et al., 2002; Origo and Pagani, 2009). On the other hand, the harmful effects of job insecurity have been proved to cross job borders, and a long list of the negative outcomes of job insecurity can be found in the literature. In particular, job insecurity has been associated with various social ills including low subjective well-being (De Witte et al., 2015, 2016), diminished psychological health (Burgard et al., 2009; Rohde et al., 2017; Kopasker et al., 2018), mental health (Cheng and Chan, 2008; Green, 2011; De Witte et al., 2015, 2016; Reichert and Tauchmann, 2017) and general self-rated health (Laszlo et al., 2010). The result that job insecurity correlates negatively with well-being and health outside the workplace still exists after controlling for socio-demographic characteristics (e.g., age, sex and education) economic factors (e.g., income) and work characteristics (e.g., type of work, and level of responsibility).

All in all, perceived job insecurity, although not socially-visible like job loss or unemployment, is associated with poor health levels net of objective employment disruptions, which might represent an even wider population health threat than real job loss or unemployment (Burgard et al., 2009). While in the short-run it is likely that the effects of job insecurity are just emotional (higher risk of anxiety, tension or dissatisfaction), physiological (elevated heart rate) and behavioral (drug use, absenteeism, lack of concentration), in the long-run job insecurity could lead to more permanent and intensive adverse consequences for workers' mental and physical health.

The negative consequences of job insecurity can be explained based on diverse, but complementary theoretical perspectives.[1] For instance, according to the Jahoda's (1982) *latent deprivation model,* the perception of losing one's job is problematic, given the importance of work in our society, not only as an important source of earnings, but as the key to individual's social participation and integration. The prospects of losing one's job may thus imply the frustration of fundamental human needs. First, the need for autonomy, that refers to having authorship of one's actions and to feel psychologically free. Second, the need for belongingness that refers to the propensity to feel connected to others and to experience intense, meaningful social relations. Finally, the need for competence that refers to individuals' inclination to influence the environment and to obtain desired outcomes. In line with Jahoda's theory, the *Appraisal* (Lazarus and Folkman, 1984, Lazarus, 1999) and *COR* (Hobfoll, 1989) theories are also based on the assumption that job insecurity is threatening. However, while the *Appraisal* theory assumes that employees evaluate their resources to cope with job insecurity as ineffective and therefore insufficient, the *COR* theory assumes that job insecurity consumes resources. Another theoretical perspective is the one offered by the Warr's (1987, 2007) *vitamin model.* Unlike the previous individually oriented theories that highlight individuals' ability to cope with different situations, the vitamin model is an environmentally oriented theory. This model predicts that job insecurity implies unpredictability about future, which makes it difficult to react adequately. This unpredictability reduces psychological well-being. Besides unpredictability, uncontrollability is even more important. Individuals can usually do very little to decrease their insecurity, insofar as they have mostly no influence on the decision of whether they will be dismissed or not. Thus, job insecurity is problematic because it implies powerlessness or a lack of control, and the feeling of powerlessness erode mental and physical health.

Nonetheless, there is evidence that the association between job insecurity and self-reported health might be modified by some factors. For instance, it is found that female employees are overall more likely to be affected by job insecurity than their male counterparts (Menéndez et al., 2007).[2] However, other papers have provided evidence that job insecurity is more detrimental for men than for women (Ferrie et al., 1995).

By age, the evidence suggests that adult employees face a particularly high risk of health deterioration when experiencing job insecurity (Cheng and Chan, 2008). This can be partially explained by the fact that the unemployment status is generally less acceptable for people at the middle of their working life than for other age groups due to their family responsibilities, and other economic circumstances like having a considerable amount of loans (Sverke et al., 2002).

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[1] The paper of De Witte et al. (2016) provides a meta-analysis on the relationship between job insecurity and health and well-being. It contains a detailed description of the main theoretical perspectives that have been used as the potential mechanisms behind this relationship.

[2] This finding can be explained by the fact that women experience higher temporary employment rates than men and suffer from discrimination in the labour market.

As regards education, the evidence is mixed. Some findings reveal that the detrimental health effect of job insecurity is higher among employees with low education than with high education. This result can be partially attributed to their poorer social and financial resources (Sverke et al., 2002). However, other papers have showed that highly educated workers are more likely to be at risk of ill health when facing job loss (Schaufeli, 1992).

In terms of economic and financial circumstances, the available evidence is still scarce. There is evidence suggesting that the income-rich suffer from job insecurity at a magnitude comparable to the income-poor (Lam et al., 2014; Kopasker et al., 2018). In this respect, it can be concluded that income fails to be an important mediating factor in the relationship between job insecurity and health. Therefore, to the best of our knowledge, the question whether factors other than income (such as personal wealth and indebtedness) may better capture the individual's financial situation and consequently mediate in the job insecurity-SAH relationship is still unexplored. This is an important gap, insofar as describing the health effects of job insecurity in an average sense, i.e., disregarding the role of relevant financial conditioners, may be overly simplistic. The only available evidence so far, Meltzer et al. (2010), comes from the field of psychological medicine and shows that job insecurity has a strong association with feelings of depression even after controlling for personal debts. However, our work differs from theirs in two important dimensions. First, we distinguish between mortgage and non-mortgage debts, and we account both by pending debts (stock) and debt burdens in terms of debt-to-income ratios (flows). In contrast, Meltzer et al. (2010) only consider a dummy for individuals with (any) debt arrears in the past 12 months, abstracting from debt types and size. Second, while they rely on statistical, not econometric, methods for their analysis, we adopt an econometric approach that allows us to control for the abovementioned endogeneity problems.

Reverse causality and endogeneity, coming from both job insecurity and debt burdens, are an important concern in this type of research. The first source of endogeneity comes from the fact that job insecurity may be more frequently reported by people rendered pessimistic by a mood disorder (Ferrie et al., 2005). Moreover, as the variables involved are typically self-reported, it is likely that any association between them may be spurious if, for instance, an underlying negative reporting style determines individuals' responses of both self-assessed health and insecurity. Although, the meta-analysis of De Witte et al. (2016) shows strong evidence for normal causation (job insecurity influences both psychological well-being and somatic health over time), while reverse or reciprocal causation is rarely found, reverse causality still remains a major concern among researchers. Green (2011) and Otterbach and Sousa-Poza (2016) partially deal with these issues using fixed effects estimations that factor out the individual-specific effects. Kopasker et al. (2018) follow an instrumental variable approach and use occupation, industry and region average levels of relevant forms of economic insecurity as instruments of perceived job insecurity. The rationale behind these instruments is that changes at the regional, industry, or occupational-

level will only impact on individuals' health by altering expectations about their own employment or financial situation. Caroli and Gorard (2016) use cross-country data from the 2010 European Working Conditions Survey and instrument perceived job insecurity using the interaction between the stringency of employment protection legislation in the country where the individual lives and the natural rate of dismissals in the industry where she is employed. They show that the fear of involuntary job loss exerts a negative impact on some specific measures of health even after controlling for reverse causality.

The second source of endogeneity appears in the correlation between debt burdens and health. Over-indebtedness, by itself, may affect individual health status for several reasons, including emotional states associated with depression and anxiety (Bridges and Disney, 2010), declining physical health (Drentea and Lavrakas, 2000), and unhealthy behaviors (Averett and Smith, 2014). However, the causal impact of debt on health is still a contested matter. Few attempts in the literature have traced the links in the chain of causation from debt to health and from health back to debt. While the results are mixed, most studies suggest that the direction of causality runs from indebtedness to poor health. Using a variety of instruments for pending debts, Brown et al. (2005) show that household heads who have outstanding non-mortgage credits, and who have higher amounts of such debt, are significantly less likely to report complete psychological well-being. Lyons and Yilmazer (2005) use a simultaneous equation model to test the extent of reverse causality and find that poor health significantly raises the probability of financial strain. However, in a similar setting, Bridges and Disney (2010) find that most of the causality goes from indebtedness to health. Similarly, Lau and Leung (2017) find that mortgage indebtedness exerts a negative impact on health outcomes. They use declines in home values post 2006 as an exogenous shock to identify the effect of loan-to-value on health and data from the US Health and Retirement Survey. Gathergood (2012) relies on movements in local-level house prices as exogenous variations of mortgage arrears. His results, based on BHPS data, show that part of the observed cross-sectional variation in psychological health between those with and without debt problems is due to the (endogenous) selection into these categories. Keese and Schmitz (2014) use different subsamples of individuals to block potential channels of endogeneity and find similar results across samples, therefore confirming the effect of debts upon health.

3. Methodology

We initially propose a standard empirical model for self-assessed health:

$$SAH_i^* = \gamma_0 + W_i^{'}\gamma_1 + Z_i^{'}\gamma_2 + T_i^{'}\gamma_3 + \varepsilon_i \tag{1}$$

where SAH_i^* is self-assessed health for individual i in period t.[3] Vector Z_i includes a set of variables commonly accepted in the literature. Vector T_i represents time fixed effects. The individual error term (ε_i) is assumed to be independent and to follow a normal distribution with a zero mean.

Vector W_i, the crux of our analysis, will be used to test whether debt burdens enhance the possible detrimental effects of perceived job insecurity. The vector, thus, comprises controls for job-insecurity and debt-burdens and their interactions. Hereafter, we will refer the resulting categories as individual's *economic situation*.[4]

As pointed out in the introduction, to address possible endogeneity concerns coming from job insecurity and over-indebtedness, we employ the Deb and Trivedi's (2006) approach.[5] Hence, Equation (1) is decoupled into two equations: a first one for the individual categories of *economic situation* (selection), and a second for self-assessed health (outcome). The selection and the outcome equations are assumed to be linked via observed and unobserved characteristics.

More specifically, we define W_i to be a vector of binary variables, b_j, $j=1,..,J,$ representing individual observed categories of *economic situation*. The probability of any category can be represented as:

$$\Pr(\mathbf{b}_i|\mathbf{X}_i,\mathbf{M}_i) = g\left(\mathbf{X}_i'\beta_1 + \sum_{k=1}^{J}\phi_{1k}m_{ik}, \mathbf{X}_i'\beta_2 + \sum_{k=1}^{J}\phi_{2k}m_{ik}, \ ... \ , \mathbf{X}_i'\beta_J + \sum_{k=1}^{J}\phi_{Jk}m_{ik}\right)$$

where g is a multinomial probability distribution and X_i is a vector of exogenous variables. Additionally, there are latent factors, m_{ik}, which incorporate unobserved characteristics that are likely to determine health, and individual's economic situation status simultaneously.

Then, the outcome equation, self-assessed health for individual i can be rewritten as:

$$SAH_i^* = \gamma_0 + \sum_{j=1}^{J}\gamma_{1j}b_{ij} + \sum_{j=1}^{J}\lambda_j m_{ij} + Z_i'\gamma_2 + T_i'\gamma_3 + \epsilon_i \qquad (2)$$

where Z'_i and T_i' are the set of exogenous covariates and time fixed effects as in Equation (1), γ_{1j} denotes the selection effects and λ_j are factor loadings. Note that the error term of Equation (1) has been decomposed into a pure random error ϵ_i and the latent factors, m_{ij}, which are unobservable characteristics that are included also in the selection equation. Two features of the model require a set of normalization restrictions to identify the parameters in the estimation. First, since the multinomial model consists of a system of J equations, it has $J(J+1)/2$ parameters in the empirical variance-covariance matrix. The model, as specified, has J^2 parameters which is larger than $J(J+1)/2$ for any $J>2$. Second, because the selection equation includes only individual-

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[3] SAH_i^* is the latent variable underlying the observed values of self-reported health, *SAH*, a five-point scale ranging from very bad to very good health. Thus, we adopt a Probit-adapted ordinary least squares (POLS) approach, as developed by Van Praag and Ferrer-i-Carbonell (2008), for the outcome equation.
[4] See next section for a detailed description of the categories.
[5] This method avoids the problems related to forbidden regression as pointed out in Wooldridge (2010). It also allows us to properly address reverse causality and other possible sources of endogeneity.

specific variables, identification requires more restrictions on variance-covariance parameters as compared to other models in which there are alternative-specific covariates. Following Deb and Trivedi (2006), the set of restrictions that makes the model suitable for estimations implies that $\phi_{jk} = 0 \quad \forall j \neq k$, that is, each choice is affected by a unique latent factor. Additionally, we impose $\phi_{jj} = 1 \quad \forall j$, which normalizes the scale of each choice or selection equation. These restrictions allow us to write the choice model as:

$$\Pr(\mathbf{b}_i | \mathbf{X}_i, \mathbf{M}_i) = g\left(\mathbf{X}_i'\beta_1 + m_{i1}, \mathbf{X}_i'\beta_2 + m_{i2}, ..., \mathbf{X}_i'\beta_J + m_{iJ}\right)$$

Then, a joint distribution for selection and outcome variables conditional on the common latent factors is formulated, where we assume a known distribution function for the common latent factors that can be integrated out of the joint density. A simulated likelihood method is used for the estimation. As pointed out by Deb and Trivedi (2006), the parameters of a semi-structural model, as the one described above, are identified through nonlinear functional forms even if all the variables in the selection equation are included in the outcome equation. However, for a more robust identification we use traditional exclusion restrictions by specifying exogenous variables in the selection equation that are excluded from the outcome equation. All the determinants are described in detail in the next section.

4. Data set and variables

4.1. Data

We use data from the Spanish Survey of Household Finances (EFF), a representative dataset of the Spanish population issued by the Bank of Spain. This database provides very detailed microeconomic information on income, assets, debts and expenditures of Spanish households. Issued in 2002, it enabled researchers to conduct pioneering work on the financial status and net worth of families in Spain. With a panel structure, the following waves were drawn in 2005, 2008, 2011 and 2014. However, for the purposes of the paper, we will consider only the 2011 and 2014 waves. As we will describe in detail in Section 4.3, this selection criteria is due to the availability of reliable information on perceived job insecurity. We restrict the sample to wage earners and individuals aged between 16 and 64 years old. The final sample comprises 6.518 observations.[6]

4.2. Self-assessed health

The EFF contains a subjective health status question with a five-point response scale ranging from

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[6] Item-non-response is not a problem in the public version of the EFF. This is so because the 'No Answer' or 'Don't Know' replies for all the variables in the survey have been imputed. Since item non-response is not random, the goal of imputation is precisely to correct for the potential problems of composition bias that researchers face when they are forced to drop observations with missing values. For a detailed description of imputation in the EFF see Barceló (2006). In our own calculations, we found that the prevalence of imputation in the EFF is relatively low (below 5% in most financial variables used in the paper).

'1-very poor' to '5- very good'.[7]

Although the literature is controversial on the validity of subjective measures of health, social scientists frequently believe that self-evaluations of health reflect more accurately individuals' overall physical and mental well-being, and therefore are better predictors of individual labor force participation, retirement decisions, and other behaviors. In addition, self-reported measures of health have been shown to be significantly correlated with physicians' assessments and are a strong predictor of morbidity and mortality (Baker et al., 2004). Furthermore, unlike other indicators, most surveys across the world are very consistent in framing the question on self-assessment of health, facilitating cross-country comparisons with previous works (van Doorslaer and Xoolman, 2004). Finally, it is not clear that other more objective health measures are not subject to reporting error. In this respect, Baker et al. (2004) matched a wide range of self-reported chronic health conditions to records of public health care usage in Canada, finding clear evidence that such conditions are subject to a large amount of systematic reporting error. Thus, even if there is an increased availability of more objective measures of health, SAH continues to be a reasonable source of health data.

In Table 1 we report a descriptive analysis of our dependent variable, *SAH*. More than 80% of the sample individuals report good or very good health, the average being 4.25 over a maximum of 5.

[Table 1 here]

4.3. Job insecurity and debt burdens

As described in Section 3, Equation (2) includes a vector W_i to capture the relationship between self-assessed health and individual's *economic situation*, this latest defined in terms of job insecurity and debt burdens. The measure of job insecurity used in the paper is subjectively appraised and based on the question: "What do you think is the probability that you lose your current job in the following 12 months" (from 0 to 100). This question appears only in the 2011 and 2014 waves of the EFF and, therefore, we drop earlier waves.[8]

A methodological concern at this point is the choice of a threshold to define job insecurity. We opt for using the sample average reported probability of losing one's job in the following 12 months, about 30 percent,[9] as selection criteria. As can be observed in Table 1, 57.9% of the sample workers are job secure, while the remaining 42.1% are job insecure workers. To explore the validity of this subjectively-appraised information, in the bottom part of the table we examine the distribution of secure and insecure workers by education, contract duration and age groups.

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[7] We reverted the original scale so that a negative coefficient in the regression results implies worse perceived health.
[8] In 2002, 2005 and 2008, the question was formulated in a different way: "Do you expect to give up work in the next twelve months?", the candidate answers being "yes" or "no". Unfortunately, this question does not preclude the possibility that people willing to leave employment voluntarily answer in an affirmative way.
[9] Table A.1 in the Appendix A shows the distribution of reported probabilities in the sample.

We find that job insecurity is relatively low among the high-educated, workers with a permanent contract and old-aged individuals. This matches a priori expectations and indicates that the variable under scrutiny captures meaningful information regarding the individuals' risk of losing their jobs. Average health and the distribution across health categories is very similar for secure and insecure workers (see Table 1). This result is not sensitive to the choice of the threshold [10] and suggests that the relation between job insecurity and health is not apparent in the raw data.

Measuring financial hardship caused by debt burdens has been also an important challenge among researchers. Despite there is no set of standardized and harmonized statistics on it, and empirical research on the matter is typically limited by data availability, many papers have focused on over-indebtedness. Overall, people are considered over-indebted if they are having difficulties meeting (or are falling behind with) their household commitments, whether these relate to servicing secured[11] or unsecured borrowing, or to payments of rent, utility or other household bills.[12] Therefore, over-indebtedness involves complex and multi-dimensional areas and can hardly be measured by just one indicator.

In this paper we use information on monthly debt payments to calculate an indicator of over-indebtedness: the debt payments-to-income ratio[13]. It is generally accepted that the share of household income dedicated to debt repayments is an adequate measure of debt burden (Drentea and Lavrakas, 2000; Lyons and Yilmazer, 2005; Keese and Schmitz, 2014). A refinement of the paper is that we discriminate among different types of debt: mortgage and non-mortgage. We proceed by defining a categorical variable to cover four different groups of over-indebted individuals according to the type of debt and the values of debt-to-income ratios: i) individuals with only mortgage debts and debt-to-income ratios above the average; ii) individuals with only non-mortgage debts and debt-to-income ratios above the average; iii) individuals with both types of debts and debt-to-income ratios above the average; iv) the remaining categories that we will refer as non over-indebted. As shown in Table 2, the first group accounts for 17% of the sample, while the second and third groups comprise 10% and 6%, respectively. [14] Among those groups the highest *SAH* is reported by those having only mortgage debts, while the lowest corresponds to those with only non-mortgage debts.

[Table 2 here]

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[10] In Table A.2. of the Appendix A we report the average and the distribution of SAH for different thresholds to define job insecurity. We observe no changes.

[11] Secured borrowing refers to a loan that is backed with an asset held by the borrower; often their home.

[12] See European Commission (2008) for an attempt to lay the foundation of a common definition of over-indebtedness susceptible to be implemented on a European-wide scale.

[13] As previous papers in the literature (see for instance Keese and Schmitz, 2014), we exclude observations with unreasonably high debt-to-income ratios (more than 0.7). This implies eliminating 8.2 % observations from the original sample.

[14] We have also considered different thresholds. We will comment these cases in the results section.

The contribution of the paper relies on the consideration of the joint effect of job insecurity and over-indebtedness. Therefore, we will consider a categorical variable for individual's *economic situation*, (vector W_i in Equation (1)) that combines the abovementioned four categories of over-indebtedness together with the dummy variable of job insecurity. Thus, vector W_i comprises eight categories of workers and we fix job secure workers with no debts as reference category. As showed in Table 3, the most frequent condition is having no debts.

[Table 3 here]

4.4. Other covariates and exclusion restrictions

In Equation (2) we include a vector Z_i of variables related to resources and standard socio-economic characteristics. Table 3 contains the main statistics of these variables. One important determinant of SAH widely examined in the literature that analyzes the socioeconomic gradient in health is income. In our sample, average equivalent annual income (*Equivalent Income*) is €27,176. Given that income is a flow and, as such, it is unable to capture long term financial conditions that, arguably, are more important determinants of health, we also account for wealth. We consider five dummies to control for non-linear effects of wealth (*Wealth_1* to *Wealth_5*). These dummies take value 1 if the household wealth belongs to the different wealth quintiles. 4% of the sample are located at the fifth quintile, while 29% belong the first quintile. We also account for the amount of pending debts (*Pending debt*). We hypothesize that being conscientious of the amount of pending debts has effects on individual health over and beyond the effects arising from monthly payments. The sample average pending debts is 75,154.2 euros.

Additionally, to rule out the possibility that the negative effects of pending debts and debt payments on health are due to either an impoverished standard of living or poor disposable income prospects, we include additional controls. In particular, we consider annual spending in food either inside or outside home (*Spending*), as well as two dummy variables (*Expected Savings High* and *Expected Expenses High*) indicating whether the respondents believe that their savings and expenses will be higher in the future than at present.[15] On average, respondents spend €15,279per year in food, whereas 16% and 39% think that their savings and expenses will be higher, respectively.

In terms of socio-demographic characteristics, less than half of individuals are females (*Female*). The average individual is about 42 years old (*Age*). The group of individuals with a primary level of education (*Primary Education*) represents 16% of the sample, while individuals with secondary (*Secondary Education*) and tertiary education (*Tertiary Education*) comprise 39% and 45% respectively. 48% of respondents are household heads (*Head*), 2% live with dependents older than 70 (*Dep_old*), 40% with dependents younger than 16 (*Dep_young*), 27% are singled

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[15] Although the wording on both questions is *1. higher, 2. lower, 3. the same, 4. don't know*, the two dummies introduced in the regression are activated when the respondent answered "higher".

(*Single*) and 85% are homeowners (*Owner*). 77% of the sample has a permanent contract (*Permanent Contract*), and average household work intensity (*Work Intensity*) is 0.74.[16]

As pointed out by Deb and Trivedi (2006), the parameters of a semi-structural model like the one described above, are identified even if all the variables in the selection equation are included in the outcome equation. However, for the sake of more robust identification we include, apart from the abovementioned socio-economic characteristics, a set of exogenous covariates in the selection equation, which add little or no explanatory power to the self-assessed health equation. In particular, following Rohde et al. (2014) and Kopasker et al. (2018), we consider mean levels of job insecurity by occupation, industry and by sector of activity (*Av.Insec_Size*, *Av.Insec_Occupation* and *Av.Insec_Activity* respectively). Additionally, we consider two extra dummy variables indicating: i) whether the individual has received inheritances (*Inheritance*); and ii) whether the individual is a risk lover (*Risk-lover*).[17] We find that on average about 30% of the sample have received some form of inheritance during the period of analysis. Risk lovers amount to 2% of the sample.

5. Results

In Table 4 we report the determinants of SAH. We report results under two different settings. The first one assumes exogeneity of the different categories of individual's *economic situation* (Model 1), while the second allows for the endogeneity of these variables (Model 2). To this purpose, Model 2 specification comprises a set of two equations: an outcome equation with a structural-causal interpretation, and a selection equation that models the generating process of the treatment variables (individual's *economic situation*). In all cases the reference category comprises non over-indebted and job secure workers. Before proceeding with the discussion of the results, we find, using the likelihood ratio (LR), that individual's economic situation is indeed endogenous.[18]

[Table 4 here]

Starting with the scenario where the individual's *economic situation* categories are assumed to be exogenous (Model 1) we observe that job insecurity causes deleterious health effects. However, these effects are only among non-indebted individuals. Indebted individuals with an unsecure job are not significantly worse off than job secure workers. These results change substantially when we control for self-selection into the different *economic situation* categories (Model 2).

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[16] Work intensity is a standardized measure in the economics of the household literature. It is the ratio between the number of all household members working full time plus the number of part-timers divided by two and household size.
[17] The degree of risk aversion is computed using self-reported information. Risk lovers are defined as those who declare to be willing to accept huge and high financial risk.
[18] We test the joint hypothesis that the λ's are equal to zero which indicates that they are not exogenous. The LR test statistic goes from around 140 for indebtedness and 120 for over-indebtedness. In either way, the values are large relative to the conventional 95% critical values for a chi-square with five degrees of freedom. Additionally, as pointed out by Deb and Trivedi (2006), tests of overidentification have not been developed for this framework.

Specifically, our findings provide two expected results, after correcting for selection, there is a negative impact of job insecurity and of over-indebtedness on SAH.

First, the detrimental health effect of job insecurity can be explained, as revised in the Section 2, by the perspective that secure employment is viewed as a resource that is not only valued in itself (e.g., salary, social interaction), but it is also valued because it serves as a mean to obtain other valued resources (e.g., social status, marketable skills and knowledge) that satisfy important needs.

Second, in line with previous literature that analyses the debt-health nexus, we find that in general being over-indebted after correcting for selection, causes SAH losses. However, we obtain an exception which corresponds to job secure individuals with mortgage debts, who are found to be better off than job secure non-indebted workers (the reference category). This result may seem somewhat surprising insofar as having debts is expected to harm well-being. However, it should not be so if we consider that mortgage debts present particularities and advantages that may more than compensate the initial negative effects of having debts. Firstly, mortgage debts allow individuals to pay and access new and better homes and, therefore, improve the stream of home services and enjoyment. Secondly, owning a home is an investment. Homes typically increase in value over time, building valuable equity for the homeowner. Equity typically provides homeowners with a significant net profit on the sale of their homes.[19] Note that our estimation equation includes a control for home-ownership. Therefore, one may expect that this variable already controls for the benefits and advantages associated with real state property outlined above. However, we must note that the correlation between mortgage debts and home ownership is relatively low.[20] This might be due to a significant fraction of homeowners have already amortized their debts or acquired their home through other channels like inheritance or cash.

Additionally, having a mortgage loan has important implications for personal saving decisions as it requires an initial deposit (i.e. down payment) to purchase a house and establishes monthly mortgage payments, and in return it provides monthly accumulation of home equity. On the one hand, mortgage payments serve as a disciplining device for the borrower to save for these payments. It also induces young households to save for the initial down payment needed to obtain a mortgage loan. On the other hand, a mortgage loan reduces the uncertainty about the biggest purchase that a typical household makes in its lifetime. This reduced uncertainty could also lead

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[19] For instance, average housing prices in Spain raised by a factor of 2.3 from 2000 to 2007 and even after including the years of the global crisis net growth is clearly positive, 66.6% from 2000 to 2014, the last year of our sample. The average yearly growth rates from 1990 to 2014 was 6.7%. Furthermore, mortgages are the cheapest money individuals will ever be able to borrow, with Euribor rates below 3% for the most part of the 2000-2014 period.

[20] The correlation of being an owner and having a positive debt-to-income ratio of mortgage debts is 0.19, while with those being over-indebted is 0.01 and not significantly different from zero.

to a significant reduction in household savings and an increase on self-reported health of household members.

However, the positive effect of being over-indebted in terms of mortgage debts reverts to be negative when it is combined with non-mortgage debts. It is precisely the combination of the two types of debts among secure workers what attracts the largest negative effect in the regressions. In economic theory, while mortgage debts might be considered as savings (or investment as described before) or affect saving behaviour, non-mortgage debts are more alike to consumption.[21] Individuals with non-mortgage debts are presumably those whose income does not meet consumption needs and suffer from a higher interest rate than those with mortgage debts. The combination of mortgage and non-mortgage debt will result in a high tightness of the consumption constraint, and therefore a larger negative effect on self-assessed health.

Now we turn into our main contribution. We find that over-indebtedness boosts the deleterious health effect of job insecurity. Or alternatively, that the effects job insecurity on health are heterogeneous across individuals' financial situation in terms of over-indebtedness. First, while over-indebtedness in terms of mortgage debts improves SAH among job secure workers, they are harmful among the job insecure. Furthermore, this pushing-up effect is accentuated in the cases where individuals are over-indebted in terms of non-mortgage debts. In particular, being job insecure and over-indebted due to non-mortgage debts is associated with a coefficient (-0.403) that almost triples the negative effect of being job insecure and having no debts (-0.151) or only mortgage debts (-0.173).

The intuition behind this result is the following. As revised before, job insecurity per se may be detrimental for health because the prospects of losing one's job not only imply losing an important source of income but it may also imply the frustration of fundamental human needs. First, the uncertainty over the main source of income – job earnings – caused by the threat of job loss would result in two different behavioural effects. On the one hand, individuals will be less prone to buy a house, not necessary less eligible given that insecurity is self-reported, and therefore they will not experience the abovementioned positive health effects associated with real state property. Moreover, in our data, the proportion of indebted individuals is very similar among secure and insecure workers, while mortgage debt-to-income ratios are lower among the later.[22] Thus, the positive health effect associated to the combination of mortgage debts and secure jobs is now more than offset by the health loss caused by an increased risk of losing the job. On the other hand, in the case of those with non-mortgage debts, again the intensive margin (the amount of the loan) instead of the extensive margin (proportion of individuals with loans) might be behind the larger negative effect among those with insecure job with respect to those with secure job.

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[21] See for example Stephens (2008).
[22] The difference in mortgage debt-to-income ratio is 15% higher for secure workers, and the equivalent for non-mortgage is 24% larger. Those differences are statistically significantly different from zero.

Second, the uncertainty about the future and the feelings of powerlessness caused by the uncontrollability feature of job insecurity would be significantly enlarged when the individual financial situation is characterized by over-indebtedness. In particular, when the over-indebtedness situation is due to the necessity to meet consumption needs – non-mortgage debts – the psychological stress and the impairment of individual health caused by job insecurity are likely to be significantly higher.

Finally, surprisingly, the effect of being over-indebted with both types of debts is not significant among insecure workers and highly significant among secure workers.

As regards the effects of the remaining variables, Table 4 shows that individuals reporting a higher level of spending and lower level of expected saving in the household report higher SAH. Moreover, SAH is significantly lower among older individuals and household heads, and significantly higher among individuals with a tertiary education and those living in households with higher work intensity. Gender, marital status, number of dependents, homeownership and type of job contract are not found to be significantly related with SAH.

With respect to the factor loading coefficients, those that are estimated to be negative and highly significant, for example $\lambda\_Insecure\ job\ and\ only\ mortgage\ debt$, imply that the unobserved factors that increase the probability of belonging to this category, in this case having a perception of job insecurity and mortgage debt-to-income ratios above the average, also lead to lower levels of SAH relative to the unobserved factors randomly assigned to this category. This means that there is significant favourable selection on unobservables into this specific family arrangement. That is, assuming exogeneity underestimate the effect of such situation. The reverse is true for those factor loading coefficients that are positive and highly significant.

5.1. Selection into economic situation categories

Taking advantage of the Deb and Trivedi's (2006) methodology, we can analyze selection into the different *economic situation* categories in terms of job security and over-indebtedness (see Table 5). The results show that self-selection is closely related with individual financial situation and socio-economic background. The estimates are relative to the reference category "non over-indebted and job secure workers".

[Table 5 here]

Firstly, we find that a lower income is a significant predictor of over-indebtedness. However, it is not clearly related with insecurity, for it fails to be statistically significant when we account for selection into "insecurity and no debts". Similarly, the income coefficient does not vary much when we switch from security to insecurity within a specific category of over-indebtedness.

Secondly, wealth is closely related with having mortgage debts. Relative to the lowest interval of wealth, individuals in upper intervals are significantly more prone to end up having

mortgage debts. In contrast, wealth intervals are quite unrelated with the probability of having non-mortgage debts or simultaneously both types of debts. As for the role of wealth in preventing insecurity, we find mild evidence in favor of this. The coefficients on wealth when accounting for mortgage debts are sensitively higher when individuals are secure than when they are insecure. Similarly, being in the top wealth quintile reduces significantly the probability of being insecure and having both debts, while it fails to be significant when explaining the probability of being secure and having both debts.

Thirdly, current spending and individual expectations regarding savings are slightly related with job insecurity. Probably, relative high household spending reinforces the perceptions of financial risk following a job loss. The positive coefficient found in columns 4 and 5 is consistent with this view. Similarly, individuals who expect to improve their savings in the future are less likely to be insecure. This holds among individuals with either no debts or mortgage debts.

Fourthly, having a permanent contract reduces significantly the chances of being insecure, regardless of the over-indebtedness situation of the individual. While the coefficient of this variable is not significant when accounting for secure outcomes, it is negative and well-defined when accounting for job insecurity.

Fifthly, work intensity reduces the chances of having non-mortgage debts. This finding is consistent with the notion that households that work more hours are less dependent on contingency loans, especially if they have some flexibility to adjust the amount or working load at the job.

Finally, in the bottom part of the table we report the effects of mean levels of job insecurity by size of the firm, occupation and sector of activity. The results are very interesting because they show that the individual perception of insecurity does not depend only on individual's circumstances. It also depends on aggregate factors and conditions that provide individuals with additional information regarding job risks and uncertainties.

5.2. Robustness check

We consider alternative thresholds for the definition of job insecurity and over-indebtedness. In Table A.3 of the Appendix A we report the estimation results. In the benchmark results an individual is regarded as over-indebted if her debt-to-income ratio is above the average (0.25 and 0.15 in the case of mortgage and non-mortgage debts, respectively) and job insecure if the reported probability of losing the job is above the sample average (0.30). In Table A.3 we alter these criteria. In the first column we lower the threshold for the mortgage debt-to-income ratio to 0.20 and keep the remaining thresholds constant. In column 2 we procced likewise and lower threshold for the non-mortgage debt-to-income ratio to 0.10. In the last column we set the threshold of job insecurity to 0.25. In general, the results are every similar to those from the

benchmark model. In all cases the coefficient on job security and mortgage debts is positive and significant, while non-mortgage debts are associated to substantial SAH losses. Although there is some cross-model variation in the coefficients, we obtain confirmation of one of the most salient results of the paper: the negative health effects of job insecurity are magnified when individuals are over-indebted, especially in terms of non-mortgage debts. In fact, in the last column of Table A.3 job insecurity with no debts fails to attract a significant coefficient. In contrast, the estimate for job insecurity with non-mortgage debts is very negative and significant in all columns. All in all, the sensitivity analysis suggests that the main results of the paper are not dependent on a particular definition of the different thresholds. [23]

6. Discussion and Conclusions

Using data from the Spanish Survey of Household Finances (EFF) for the 2011-2014 period, this paper shows that financial conditioners may act as *moderators* in the relationship between job insecurity and health. Insofar as these moderators can either buffer the negative consequences of job insecurity or boost its impact, they offer important practical clues for the development of interventions.

In line with previous studies, our results underline the stressful nature of job insecurity: Uncertainty about one's job is a rather enduring experience, and is harmful to individual's health. Nonetheless, our main contribution is the finding that debt-burdens – especially as related to non-mortgage debts – significantly boost the deleterious health effects of job insecurity. Specifically, the results suggest that being over-indebted with non-mortgage debts can increase the negative effects of job insecurity by a factor of three.

Several policy implications can be derived from our results. Firstly, as a result of globalization and increasing competition, European labour markets have experienced an increased flexibility, which has led to a non-negligible proportion of worker in Europe affecting by job insecurity. Because of that, the concerns about job insecurity and its impact of individual's health have gained attention in the political arena and translated into multiple initiatives to address these concerns. The results in this paper show that concerns about job insecurity should not be decoupled from the concerns about increasing household indebtedness. This might be especially the case when the economic conditions are similar to the ones experienced by most European countries in the last years. European households have undergone significant economic upheaval, registering record income and debt increases in the run-up to the financial crisis, and unprecedented subsequent financial fragility together with a worsening of labour market conditions. The multifaceted economic dangers unveiled by the 2008 crisis have affected people's

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[23] Given a reasonable amount of variation around the benchmark definition. The results under a wide set of alternative combinations is available from the authors upon request.

lives in many spheres, from the fear of losing one's job to the anxiety of not being able to make ends meet, from being overindebted to suffering a sharp fall in asset prices.

Secondly, given that the effects of job insecurity on health are substantially larger among the over-indebted, the negative effects of rising inequality levels in modern societies, especially during economically turbulent times, might be higher than previously thought. Insofar as over-indebtedness – especially related to non-mortgage debts – boosts the negative impact of job insecurity on health, policies aimed at this very fragile segment of the population should be of potential relevance to buffer the negative consequences of job insecurity.

Two complementary routes might be followed in developing interventions. First, measures aimed at improving financial literacy at early stages, with special focus to debt literacy, or policy initiatives to fund debt counseling agencies that support household affected by financial problems to reschedule debt payments could serve to prevent the negative health consequences of over-indebtedness. Second, measures intended to promote coping strategies that may act as moderators in the relationship between job insecurity and health. Coping strategies have been classified either into problem-solving (efforts to do something active to alleviate stressful circumstances) versus emotion-focused (efforts to regulate the emotional consequences of stressful or potentially stressful events), or active versus avoidant (Lazarus and Folkman, 1984, Lazarus, 1999). Identifying and promoting those strategies that are the most effective in buffering the harmful effects of job insecurity should be of key relevance to improve individual's welfare and reduce inequality levels among individuals with heterogeneous financial conditions.

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APPENDIX

Table 1: Self-assessed health and insecurity

Self-assessed health		All workers	Secure Workers[a]	Insecure
Mean		4.25	4.26	4.24
Std. Dev		0.67	0.68	0.66
Min		1	1	1
Max		5	5	5
Frequencies				
Very Poor		0.06	0.03	0.11
Poor		1.10	1.37	0.73
Fair		9.39	9.00	9.92
Good		52.39	51.48	53.13
Very Good		37.06	37.75	36.11
			Secure Workers	Insecure
% population	All Workers		57.90	42.10
	Workers with primary educ.		52.87	47.13
	Workers with secondary educ.		56.92	43.08
	Workers with tertiary educ.		68.82	31.18
	Workers with temporal contract		22.95	77.05
	Workers with permanent contract		71.75	28.25
	Young workers		41.36	58.64
	Middle-aged workers		64.80	35.20
	Old aged workers		80.59	19.41
N. Obs.		6518	4079	2439

[a]A worker is considered to be insecure if she reports a probability to lose your current job larger than 30.

Table 2: Indebtedness and self-assessed health

	Mean	Std. Dev	Average SAH[a]	St. Dev. SAH
INCIDENCE				
Over-indebtedness[b]				
No debt	0.67	0.47	4.25	0.69
Only Mortgage	0.17	0.37	4.31	0.69
Only Non-Mortgage	0.10	0.31	4.12	0.70
Both debts	0.06	0.23	4.26	0.70
MAGNITUDE (IF LEVEL OF DEBT>0)				
Ratio of indebteness (only mort)	0.25	0.14		
Ratio of indebteness (only nomort)	0.15	0.11		

[a] Test are applied to check whether those groups report a statistically different level of SAH than the others
[b] Threshold to be considered as over-indebted is set as the average ratio.

Table 3. Main Descriptive Statistics of Determinants

	Mean	Std. Dev	Min	Max
Economic Situation (security[a] and over-indebtedness[b])				
Secure job and no debt (%)	0.38	0.48	0	1
Secure job and only mortgage debt (%)	0.13	0.34	0	1
Secure job and only non-mortgage debt (%)	0.04	0.20	0	1
Secure job and only non-mortgage debt (%)	0.02	0.15	0	1
Insecure job and no debt (%)	0.27	0.44	0	1
Insecure job and only mortgage debt (%)	0.09	0.29	0	1
Insecure job and only non-mortgage debt (%)	0.04	0.18	0	1
Insecure job and only non-mortgage debt (%)	0.02	0.15	0	1
Resources				
Equivalent Income[c]	27.17	23.72	1.00	3841.21
Wealth_1	0.29	0.45	0	1
Wealth_2	0.28	0.45	0	1
Wealth_3	0.23	0.42	0	1
Wealth_4	0.15	0.35	0	1
Wealth_5	0.04	0.20	0	1
Pending debt [d]	75.15	76.58	0	8.326
Spending[c]	15.28	8.827	2.13	180.00
Expected Savings High	0.16	0.37	0	0
Expected Expenses High	0.39	0.49	0	1
Socio-Economics				
Female	0.41	0.49	0	1
Age	41.97	10.16	18	64
Primary Education	0.16	0.36	0	1
Secondary Education	0.39	0.49	0	1
Tertiary Education	0.45	0.50	0	1
Head	0.48	0.50	0	1
Dep_old	0.02	0.15	0	1
Dep_young	0.40	0.49	0	1
Single	0.27	0.45	0	1
Owner	0.85	0.36	0	1
Permanent Contract	0.77	0.42	0	1
Temporary Contract	0.20	0.40	0	1
Work Intensity	0.74	0.26	0	1
Exclusion Restrictions				
Av.Insec_Size	0.25	0.07	0.16	0.33
Av.Insec_Occupation	0.26	0.07	0.07	0.38
Av.Insec_Activity	0.25	0.07	0.11	0.39
Inheritance	0.31	0.46	0	1
Risk-lover	0.02	0.15	0	1
N. Obs.	6518			

[a]A worker is considered to be insecure if she reports a probability to lose her current job larger than 0.30. [b] Threshold to be considered as over-indebted is set as the average ratio in the sample. [c]In thousands of euros. [d]In thousands of euros among those with debts.

Table 4: Estimation results for outcome equation

	Model 1	Model 2
Economic Situation (Ref. Cat.: Secure job and no debt)		
Secure job and only mortgage debt	0.088	0.142***
	(0.075)	(0.039)
Secure job and only non-mortgage debt	-0.220**	-0.361***
	(0.096)	(0.046)
Secure job and both debts	-0.032	-0.551***
	(0.149)	(0.048)
Insecure job and no debt	-0.091**	-0.151***
	(0.040)	(0.037)
Insecure job and only mortgage debt	-0.094	-0.173**
	(0.077)	(0.087)
Insecure job and non-mortgage debt	-0.123	-0.403***
	(0.104)	(0.058)
Insecure job and both debt	-0.074	-0.022
	(0.165)	(0.132)
Resources		
Income Equivalent	0.027	0.004
	(0.046)	(0.023)
Wealth 2	0.018	0.053
	(0.054)	(0.033)
Wealth 3	-0.033	-0.054
	(0.059)	(0.042)
Wealth 4	0.004	-0.027
	(0.071)	(0.038)
Wealth 5	-0.214	-0.182
	(0.136)	(0.073)
Pending debt	-0.004	0.001
	(0.004)	(0.004)
Spending	0.013	0.073***
	(0.049)	(0.022)
Expected Savings High	-0.008	-0.040*
	(0.049)	(0.025)
Expected Expenses High	-0.090**	-0.036
	(0.036)	(0.036)
Socio-Economics		
Female	0.029	0.034
	(0.035)	(0.034)
Age	-0.972***	-0.503***
	(0.080)	(0.040)
Secondary Education	0.027	0.012
	(0.055)	(0.057)
Tertiary Education	0.194***	0.175***
	(0.057)	(0.059)
Head	-0.062**	-0.057*
	(0.027)	(0.029)
Single	-0.031	-0.027
	(0.053)	(0.051)
Dep old	-0.121	-0.130
	(0.082)	(0.080)
Dep young	-0.069	-0.079*
	(0.043)	(0.043)
Owner	0.031	0.015
	(0.061)	(0.066)
Permanent Contract	-0.001	-0.049
	(0.097)	(0.101)
Temporary Contract	-0.038	-0.031
	(0.101)	(0.102)
Work Intensity	0.200***	0.176**
	(0.073)	(0.075)
Time Fixed Effects		
Constant	3.252***	-0.257***
	(0.595)	(0.017)
λ *Secure job and only mortgage debt*		-0.061**
		(0.030)
λ *Secure job and only non-mortgage debt*		0.272***
		(0.010)
λ *Secure job and both debts*		0.548***
		(0.014)
λ *Insecure job and no debt*		0.024
		(0.016)
λ *Insecure job and only mortgage debt*		-0.084***
		(0.010)
λ *Insecure job and only non-mortgage debt*		0.285***
		(0.013)
λ *Insecure job and both debts*		-0.257***
		(0.017)
N	6518	6518

Table 5. Estimation results for selection equation

	Pr (*Secure job +mortgage debts*)	Pr (*Secure job +non-mortgage debts*)	Pr (*Secure job +both debts*)	Pr (*Insecure job +no debts*)	Pr (*Insecure job + mortgage debts*)	Pr (*Insecure job + non-mortgage debts*)	Pr (*Insecure job +both debts*)
Resources							
Income Equivalent	-2.932***	-1.903***	-3.786***	-0.113	-3.327***	-2.118***	-3.323***
	(0.445)	(0.284)	(0.399)	(0.192)	(0.361)	(0.346)	(0.542)
Wealth 2	1.699***	0.402	0.657	0.485**	1.165***	0.647*	0.715
	(0.316)	(0.376)	(0.482)	(0.232)	(0.331)	(0.376)	(0.506)
Wealth 3	1.433***	0.023	0.927*	0.050	1.110***	0.169	-0.281
	(0.323)	(0.405)	(0.556)	(0.235)	(0.379)	(0.430)	(0.861)
Wealth 4	1.885***	1.364**	-0.430	-0.022	1.045**	0.705	-0.891
	(0.401)	(0.639)	(0.696)	(0.270)	(0.504)	(0.701)	(0.809)
Wealth 5	3.584***	0.547	-1782	-0.493	1.720**	-1499	-3.397**
	(0.754)	(0.822)	(1.668)	(0.414)	(0.802)	(0.963)	(1.358)
Pending debt	1.338***	0.407***	1.947***	-0.004	1.413***	0.491***	1.194***
	(0.125)	(0.032)	(0.231)	(0.017)	(0.142)	(0.044)	(0.200)
Spending	-0.030	0.346	-0.653	0.037	0.662**	0.603*	0.134
	(0.491)	(0.345)	(0.544)	(0.199)	(0.320)	(0.353)	(0.523)
Expected Savings High	-0.313	-0.070	-0.197	-0.480**	-0.696*	-0.254	-0.310
	(0.321)	(0.337)	(0.511)	(0.191)	(0.363)	(0.384)	(0.508)
Expected Expenses High	0.219	-0.003	-0.545	-0.015	0.384	0.047	0.233
	(0.232)	(0.289)	(0.424)	(0.148)	(0.258)	(0.295)	(0.427)
Socio-Economics							
Female	0.022	-0.241	0.418	0.233	0.100	-0.138	0.069
	(0.238)	(0.296)	(0.420)	(0.150)	(0.273)	(0.297)	(0.450)
Age	0.467	-0.509	0.066	-1.096***	-0.769	-0.549	0.672
	(0.559)	(0.691)	(0.909)	(0.391)	(0.630)	(0.639)	(0.900)
Secondary Education	-0.071	-1.002***	-0.372	0.289	0.482	-0.012	0.879
	(0.328)	(0.346)	(0.540)	(0.191)	(0.307)	(0.332)	(0.683)
Tertiary Education	-0.423	-1.404***	0.290	0.158	0.715**	-0.400	1.386*
	(0.396)	(0.390)	(0.589)	(0.209)	(0.356)	(0.379)	(0.819)
Head	-0.100	-0.197	-0.214	-0.076	-0.268	-0.078	-0.542**
	(0.152)	(0.255)	(0.224)	(0.133)	(0.185)	(0.241)	(0.258)
Single	0.128	0.336	0.855*	0.191	-0.391	0.647*	0.327
	(0.433)	(0.359)	(0.481)	(0.219)	(0.418)	(0.348)	(0.499)
Dep old	-0.795	-0.734	-0.763	-0.253	-0.164	0.547	0.191
	(0.522)	(0.563)	(0.733)	(0.258)	(0.549)	(0.531)	(0.786)
Dep young	0.265	-0.048	1.411***	-0.028	-0.059	0.194	0.446
	(0.269)	(0.322)	(0.447)	(0.183)	(0.297)	(0.350)	(0.440)
Owner	0.004	-1.782***	-1001	-0.293	-0.160	-1.837***	19.372***
	(0.469)	(0.394)	(0.916)	(0.245)	(0.493)	(0.447)	-6661
Permanent Contract	-0.316	0.250	0.362	-1.714***	-2.130***	-1.746***	-1.351***
	(0.345)	(0.305)	(0.598)	(0.192)	(0.296)	(0.354)	(0.478)
Work Intensity	0.383	-1.751***	-0.500	0.106	0.007	-1.610***	-0.082
	(0.458)	(0.561)	(0.736)	(0.298)	(0.542)	(0.614)	(0.869)
Exclusion Restrictions							
Av.Insec Size	3.032**	-0.006	2.685	3.020***	8.013***	2.808	6.024*
	(1.478)	(2.020)	(2.360)	(1.065)	(1.979)	(2.344)	(3.181)
Av.Insec Occupation	-1.913	0.436	-2.570	3.898***	4.076*	6.189*	0.908
	(2.015)	(2.498)	(4.338)	(1.337)	(2.316)	(3.305)	(3.036)
Av.Insec Activity	-0.859	-0.231	2.546	3.966***	3.360**	6.270***	4.039
	(1.462)	(2.090)	(2.633)	(1.010)	(1.663)	(1.985)	(2.557)
Inheritance	-0.143	0.476	1.332***	0.130	0.029	0.387	-0.334
	(0.266)	(0.359)	(0.483)	(0.147)	(0.312)	(0.393)	(0.438)
Risk-lover	0.871	-0.117	1018	0.591*	-0.355	0.160	0.154
	(1.055)	(0.950)	(1.099)	(0.318)	(0.887)	(0.992)	(1.515)
Const.	11.910***	14.968***	18.182***	2.771	10.784***	10.174**	-8.030
	(4.417)	(4.783)	(5.903)	(2.301)	(4.093)	(5.056)	(0.000)
N	6518	6518	6518	6518	6518	6518	6518

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APPENDIX A

Table A.1: Job Insecurity distribution

Perceived probability of losing job	%
0	33.28
0.1	13.54
0.2	11.08
0.3	7.38
0.4	3.07
0.5	17.16
0.6	2.64
0.7	1.96
0.8	3.11
0.9	2.24
1	4.54

Table A.2: Self-assessed health and different thresholds of insecurity

	Probability $\geq$ 10		Probability $\geq$ 20	
	Secure Workers	Insecure Workers	Secure Workers	Insecure Workers
% of population	33.28	66.72	46.82	53.18
Self-assessed health				
Mean	4.26	4.25	4.26	4.24
Std. Dev	0.69	0.66	0.67	0.67
Min	1	1	1	1
Max	5	5	5	5
Frequencies				
Very Poor	0.06	0.07	0.04	0.09
Poor	1.55	0.88	1.30	0.93
Fair	9.05	9.56	8.78	9.93
Good	51.30	52.93	51.96	52.76
Very Good	38.04	36.57	37.92	36.30
N. Obs.	2603	3915	3407	3111

Table A. 3: Estimation results under different thresholds

	Model 2.1	Model 2.2	Model 2.3
Economic Situation (Ref. Cat.: Secure job and no debt)			
Secure job and only mortgage debt	0.207**	0.142***	0.117***
	(0.092)	(0.039)	(0.034)
Secure job and only non-mortgage debt	-0.378***	-0.361***	-0.195***
	(0.035)	(0.046)	(0.039)
Secure job and both debts	-0.533***	-0.551***	-0.344***
	(0.042)	(0.048)	(0.040)
Insecure job and no debt	-0.117***	-0.151***	0.050
	(0.038)	(0.037)	(0.039)
Insecure job and only mortgage debt	-0.063	-0.173**	0.061**
	(0.100)	(0.087)	(0.029)
Insecure job and non-mortgage debt	-0.390***	-0.403***	-0.590***
	(0.057)	(0.058)	(0.035)
Insecure job and both debt	-0.008	-0.022	-0.224***
	(0.044)	(0.132)	(0.050)
Resources			
Income Equivalent[a]	-0.014	0.004	0.043*
	(0.059)	(0.023)	(0.022)
Wealth 2	-0.033	0.053	0.050**
	(0.033)	(0.033)	(0.021)
Wealth 3	-0.053	-0.054	-0.062
	(0.048)	(0.042	(0.044)
Wealth 4	-0.032	-0.027	-0.096***
	(0.099)	(0.038	(0.029)
Wealth 5	-0.242	-0.182**	-0.221***
	(0.201)	(0.073	(0.042)
Pending debt [a]	-0.003	0.001	0.000
	(0.005)	(0.004	(0.003)
Spending	0.068*	0.073***	0.065***
	(0.036)	(0.022	(0.017)
Expected Savings High	-0.063	-0.040*	-0.005
	(0.123)	(0.025	(0.022)
Expected Expenses High	-0.030	-0.036	-0.114***
	(0.022)	(0.036	(0.016)
SocioEconomic Characteristics	*Yes*	*Yes*	*Yes*
Time Fixed Effects	*Yes*	*Yes*	*Yes*
Constant	3.297***	2.574***	2.266***
	(0.511)	(0.439	(0.216)
λ *Secure job and only mortgage debt*	-0.095***	-0.061**	-0.144***
	(0.013)	(0.03	(0.010)
λ *Secure job and only non-mortgage debt*	0.225***	0.272***	0.043***
	(0.012)	(0.01	(0.008)
λ *Secure job and both debts*	0.576***	0.548***	0.470***
	(0.008)	(0.014	(0.009)
λ *Insecure job and no debt*	-0.018	0.024	-0.188***
	(0.014)	(0.016	(0.010)
λ *Insecure job and only mortgage debt*	-0.120***	-0.084***	-0.111***
	(0.013)	(0.01	(0.015)
λ *Insecure job and only non-mortgage debt*	0.251***	0.285***	0.505***
	(0.015)	(0.013	(0.008)
λ *Insecure job and both debts*	-0.277***	-0.257***	-0.112***
	(0.015)	(0.017	(0.010)
N	6518	6518	6518

Model 2.1: threshold for job insecurity 0.30, threshold for debt-to-income ratio in the case of mortgage debt 0.20 and of non-mortgage debt 0.15.

Model 2.2: threshold for job insecurity 0.30, threshold for debt-to-income ratio in the case of mortgage debt 0.25 and of non-mortgage debt 0.10.

Model 2.3: threshold for job insecurity 0.20, threshold for debt-to-income ratio in the case of mortgage debt 0.25 and of non-mortgage debt 0.15.